Amendments to the Specification:

Please replace the Abstract with the following rewritten Abstract:

A reflective grating for precision location measurement ~~is disclosed~~. In one embodiment, the reflective grating has a non-reflective substrate and a non-reflective adhesion layer disposed on the substrate layer. A reflective surface layer is disposed on the adhesion layer. In another embodiment, the reflective grating is manufactured on the reflective (polished) surface of a monolithic substrate. A series of grating lines are formed in the reflective surface layer by vaporizing portions of the reflective surface layer with a laser in order to expose the non-reflective adhesion layer. Accordingly, alternating reflective and non-reflective grating lines are formed that are used for making precision measurements.

Please replace the paragraph [0019] beginning at page 8, line 1, with the following rewritten paragraph:

Disposed on the adhesion layer 28 is a reflective surface layer 30 that is a strong reflector of IR radiation. The surface layer 30 is about 0.1 microns thick and is deposited onto the adhesion layer 28. Typically the surface layer is gold. Materials other than gold can also be used for the surface layer 30. A photo-~~imagabale~~ imageable metal oxide deposition could also be applied. The surface layer would be exposed by a laser and then via an etching process the non-exposed portions could be washed away. Alternatively, nanostructured metal coatings could be layered onto the substrate 26. Then, the reflective bands could be imaged, melted and fused to the substrate. The non-exposed material could then be washed away.

Please replace the paragraph [0034] beginning at page 13, line 11, with the following rewritten paragraph:

Referring to FIG. 7, the characteristics of the power profile for the laser pulse is shown. As illustrated, the front-end loaded power profile 70 optimally burns off the surface layer 30 and adhesion layer 28 by breaking the bonds linking the atoms within the thin metal films without heating (deforming) the substrate 26. Typically, the front-end power profile 70 is seven times greater than a square wage pulse 72 thereby accelerating the breaking of atomic bonds within the surface layer 30 and adhesion layer 28. Furthermore, the exponential pulse continues the burn off the surface layer 30 and the adhesion layer 28 because the time constant of the pulse is below the thermal time constant of the substrate 26.

~~Alternatively, the laser may also melt portions of the surface layer 30 in order to form the grating lines 32 or the surface layer 30 may be a photo-imagabale layer disposed on the adhesion layer 28 and the laser selectively exposes portions of the photo imagabale layer in order to form the grating lines 32.~~ In an alternative embodiment, the surface layer may be made of a photo-imageable material and disposed on the adhesion layer 28.

Please replace the paragraph [0036] beginning at page 14, line 6, with the following rewritten paragraph:

The read head 60 provides in-line testing of the diffraction grating 24 in order to determine whether the laser station 58 is writing correctly to the tape 52. The read head 60 will incorporate customer-specific electro-optical components and ride on a movable track in [[a]] an oscillatory trajectory along the axis of motion of the tape 52. An interferometric reference records the movements of the read head 60. The read head 60 may incorporate a ~~nyquist~~ Nyquist period sensor for long term accuracy.